Syntax

Unselected Embedded Interrogatives in German and English: S-Selection as Dependency Formation[1]

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1 Introduction

It has already been observed by Fortmann (1994, 3) that the assumption of s-selection of *embedded interrogatives* according to the lexical specification of the matrix verb does not seem to be observationally adequate: *selection of a complement clause should be independent of semantic properties of the context, i.e. of the harmony with other constituents of the matrix clause.*[2] Fortmann (1994, 4) further notes that some verbs in German select **ob**-clauses if there is a future auxiliary in the matrix:

(1) a. Der Delinquent hat gestanden, dass/ *ob** jemand ihm einen Tip gege-ben hat.
    *the – offender – has – admitted – that/ *if – someone – him – a – hint – given – has*

  b. Der Delinquent **wird** gestehen, ?**dass/ ob** jemand ihm einen Tip gegeben hat.
    the – offender – will – admit – if – someone – him – a – hint – given – has

[2] Translated and adapted from German (P.Ö.): Weiterhin sollte die Wahl des Komplementsatzes immun gegen semantische Restriktionen sein, die in der Verträglichkeit mit anderen Konstituenten des Matrixsatzes zum Ausdruck kommen.

"The offender will admit if someone has given him a hint."

This phenomenon has been termed 'unselected embedded questions' (henceforth UEQs) by Adger & Quer (1997, 2001), who made similar observations for English. Verbs of a specific class that do not select interrogatives, optionally license *if*- clauses (*ob*- clauses in German) in specific semantic contexts:

(2) a. Julie admitted that/ *if the bartender was happy.   (Adger & Quer
                                                                   2001, 110)

     b. **Did** Julie admit that/ **if** the bartender was happy?

     c. Julie did**n't** admit that/ **if** the bartender was happy.

Thus, certain structural options that are common to German and English raise the question of whether predicates really have a selectional frame specified for a syntactic 'type feature'. According to Adger & Quer, UEQs occur in the context of negative polarity. They conclude that UEQs are licensed by the same elements as negative polarity items (NPIs) in English (cf. Adger & Quer 2001, 112):

(3) a. **Noone** admitted **any**thing/ **if** the bartender was happy.
                                                         (negative quantifiers)

     b. **Only** Julie admitted **any**thing/ **if** the bartender was happy.
                                                               ('only'-focus)

     c. **If** Julie admitted **any**thing/ **if** the bartender was happy,we could order
         another drink.   (conditionals)

     d. We **refused** to admit **any**thing/ **if** they had the keys.
                                                         (adversative predicates)

     e. **Without** admitting **any**thing/ **if** they had the keys, there's nothing we
         can do.   ('without'-clauses)

Adger & Quer (1997, 2001) argue that UEQs are, in fact, DPs headed by a polar determiner that has an *if*-clause as its complement. Verbs which they call 'proposition selecting predicates' (P-predicates; Adger & Quer 2001, 109), according to them, select DPs, whereas interrogative verbs select simple CPs. Only if the DP selected by a P-predicate is in the scope of negative-polarity, will C get the formal feature specific to interrogatives (henceforth *Q*) that is lexically represented by the complementiser *if*. [3]

This assumption raises several questions concerning the asymmetry of UEQs both with selected interrogatives and with selected non-interrogatives. Do verbs licensing UEQs always select DPs, or can they also select CPs if they are not in

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[3] This model is explained in more detail in section 2.1 of this paper.

negative polarity contexts? If they select DPs under positive polarity as well, are there *that*-clauses that are CPs and *that*-clauses that are DPs? Moreover, why are both ***that*** and ***if*** possible under negative polarity? These issues will be discussed in more detail in section 2 of this article.

We will argue instead that clausal complements of all verbs are of the same category. The features of clause mood in the C-Domain of embedded clauses, however, are in a modal dependency relation with the predicate of the main clause. This syntactic dependency is constrained both by the semantics of the main clause predicate and by lexical items, tense or mood operating on the selectional properties of a specific class of polarity-sensitive verbs like *admit*. These verbs may incorporate a polarity sensitive head π that is syntactically licensed by certain operators. Thus, UEQs are, in fact, complements of complex predicates. Finally, we will suggest replacing the notion of s-selection by the formation of *well-formed syntactic dependencies* (WFDs) licensing specific LF-interpretable features in the complement.

We will argue that a feature like Q is not in fact a 'type feature' of an embedded interrogative clause, but a more universal *modal feature* indicating that a clause cannot be assigned a truth value due to propositional disjunctivity[4]. In embedded clauses, this feature must be licensed through a well-formed dependency relation with the matrix predicate. We will point out that there are other kinds of clauses besides interrogatives that are marked by Q. In other words, not all embedded 'interrogatives' refer to questions.

Moreover, we will show that *wh*-'interrogatives' and *Y/N*-'interrogatives' may occur in different contexts due to different licensing conditions. Firstly, verbs licensing ***if/ob***-clauses in the context of negative polarity license *wh*-clauses even in polarity-neutral contexts:

(4) a.   ?[5]Julie saw **if**/whether the bartender was happy with this solution.

    b.   Julie did not see **if**/whether the bartender was happy with this solution.

    c.   Julie saw **who** was happy with this solution.

(5) a.   ?Julia erkannte, **ob** der Barmann mit der Lösung zufrieden war.
       Julie – saw – if – the – bartender – with – this – solution – happy – was

    b.   Julia erkannte nicht, **ob** der Barmann mit der Lösung zufrieden war.
       Julie – saw – not – if – the – bartender – with – this – solution – happy – was

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[4] Cf. Bayer (2004, 66), who also argues that embedded 'interrogatives' do not refer to questions, but just carry a feature of 'disjunctivity'. Y/N-interrogatives can be logically analysed as the set of possible answers, namely a set of two complementary propositions (Hamblin 1976). This will be explained in more detail in § 2.4.

[5] In some contexts, a Q-feature in the complement may be pragmatically licensed. We will argue that these sentences are grammatically marked exactly because the feature is not formally licensed through a well-formed dependency.

c. Julia erkannte, **wer** mit der Lösung zufrieden war.
    Julie – saw – who – with – this – solution – happy – was

Secondly, there are verbs that license *wh*-clauses in negative contexts where ***if/ob***-clauses are not licensed:

(6) a. *His own family **believed who** he was.

  b. His own family did **not believe who** he was.

  c. His own family did **not believe** *if/**that** it was him.

(7) a. *Sie **glaubten**, **wen** er getroffen hatte.
      they – believed – who – he – met – had

  b. Sie **glaubten nicht**, **wen** er getroffen hatte.
      they – believed – not – who – he – met – had

  c. Sie **glaubten nicht**, *ob/**dass** er jemanden getroffen hatte.
      they – believed – not – that/ if – he – someone – met – had

In many cases, the licensing domains of *wh*-'interrogatives' and *Y/N*-'interrogatives' coincide. In fact, however, the modal feature of *wh*-clauses is linked to a focus projection headed by the *wh*-operator. Like *Q*, the feature *wh* is licensed through its membership in a WFD. The *wh*-dependency differs from the *Q*-dependency exactly by some crucial properties correlated with *wh*-focus. This issue will be discussed in the last section of this article.

2   Leading the Argument

2.1   Unselected Embedded Questions and C-Selection

As indicated above, the licensing of embedded 'interrogatives' can depend on *the polarity* of the main clause. The ***if/ob*-**complement seems not only to be licensed by selection, but also when it is in the scope of specific licensers. Apparently, the embedded clause must be c-commanded by this licenser:

(8) a. *[$_{DP}$ The [$_{NP}$ [$_{N'}$ [$_{N'}$ politician] that no one believed]]] recollected **if** he had stolen the documents.

  b. [$_{DP}$ The [$_{NP}$ [$_{N'}$ [$_{N'}$ politician] that no one believed]]] did **not** recollect **if** he had stolen the documents.[6]

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[6] Note that this sentence is not semantically odd, but just contradictory to encyclopaedic knowledge. This also suggests that the contrast between the sentences in (a) and (b) is a formal one.

(9) a. *[$_{DP}$ Der [$_{NP}$ [$_{N'}$ [$_{N'}$ Politiker], dem niemand glaubte]]], erinnerte sich,
         ob er die Dokumente gestohlen hatte.

     b. [$_{DP}$ Der [$_{NP}$ [$_{N'}$ [$_{N'}$ Politiker], dem niemand glaubte]]], erinnerte sich
         nicht, **ob** er die Dokumente gestohlen hatte.

Adger & Quer (1997, 2001) maintain the generative concept of local s-selection
of interrogatives by proposing that P-predicates like *admit*[7]*, mention, hear, see*
or *recollect* select DPs, and that the embedded formal interrogative is, in fact,
the complement of a covert polarity sensitive determiner 'Δ' which is the head
of this DP. Δ is licensed by negative polarity.

(10) [$_{V'}$ admit [$_{DP}$ Δ [$_{CP}$ if [$_{IP}$ ...]   (cf. Adger & Quer 2001, 124)

According to them, the feature content of C° of the embedded clause depends on
the polarity of D°. If D° is bound by a licenser of NPIs, it selects a specific
operator that is syntactically represented by *if;* otherwise, the embedded CP is
headed by **that**. Adger & Quer (1997, 2001) remain silent as to whether P-predi-
cates generally select DPs, or whether they do so only in the context of negative
polarity. Since the assumption that they always select DPs would be conceptu-
ally more consistent, further explanation is necessary for those cases where the
∅-head of this polarity sensitive DP selects a **that**-clause, or, in other words,
how the licensing of different kinds of determiners (one selecting **if** and one
selecting **that**) can be accounted for.

(11) a. He did not remember **that** he had stolen the documents.

     b. He did not remember **if** he had stolen the documents (or if he got them
         from someone).

Adger & Quer (2001) suggest that *selected* interrogatives are always CPs, and
they imply that complements of *'true/false'-predicates* are CPs, too. This means

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[7] For Adger & Quer, *admit* is clearly a V that licenses UEQs. According to our intuition, the
German verbs *zugeben* and *gestehen* (both meaning 'admit') also belong to this group. However,
many English and German speakers reject sentences like:
   He did not admit **if** he robbed the bank.
   Er hat nicht gestanden, **ob** er die Bank beraubt hat.
      Comments from the GGS conference in 2000: The verb *admit* implies guilt, which triggers a
factive presupposition, also under negation (H. Wegener); you cannot 'admit' something you did not
do (S. Vikner).
      We think this is clearly true for the German verb *eingestehen* (≈ 'admit'), but not necessarily
for *zugeben* and *gestehen*. These differences point to idiosyncratic semantic properties of verbs like
admit which differ minimally, yielding different presupposition properties. Another interesting fact
is that:
   He did not admit *whether* he robbed the bank.
      is more acceptable than (i) (Ian Roberts, p.c.). This might not only give new aspects to the
discussion of the minimal semantic difference between the two junctors **if** and **whether**, but also
clearly shows that the differences in acceptability are grounded on minimal variation of idiosyncratic
lexical entries.

that predicates with complement clauses are divided into those selecting CP-clauses and those selecting DP-clauses. The first problem with this view is the fact that many verbs that are not P-predicates can generally select DPs. This is, of course, true for interrogative verbs like *ask*:

(12) He asked my name.

Verbs like *maintain/ behaupten* exclusively select ***that***-clauses independent of polarity. They also select DPs, however:

(13) a. Julie maintained **that/** *if the bartender was happy.   (Adger & Quer 2001, 110)

   b. **Did** Julie maintain **that/** *if the bartender was happy?

   c. Julie did **not** maintain **that/** *if the bartender was happy.

(14) Julie maintained [DP her claim].

Thus the discrimination of P-predicates from other verbs on the grounds of c-selection, which is not independently motivated, obviously needs further refinement. In the remaining parts of this section, we will argue for a unified analysis of the license for selected interrogatives and UEQs. This will ultimately lead us to a formal analysis of interrogative selection as dependency formation.

2.2   UEQs, Free Choice Reading, and Context Dependency

Adger & Quer (1997, 2001) note that verbs which license UEQs under negative polarity may do so in polarity-neutral contexts, too. In this case, the embedded CP gets a 'free choice'[8] reading, which is 'semantically peculiar', but not ungrammatical:

(15) a. **Nobody** admitted, **if** there was life on Mars.

   b. ?NASA admitted, **if** there was life on Mars.   (Adger & Quer 1997, 9)

Similar pairs can be found in German:

(16) a. Er wollte nicht zugeben, ob er das Buch wirklich gelesen hat (oder nicht).
he − wanted − not − admit − if − he − the − book − really − read − has − or − not

   b. ?Er hat nun zugegeben, ob er das Buch wirklich gelesen hat (oder nicht).
he − has − now − admitted − if − he − the − book − really − read − has − or − not

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[8] Adger & Quer term this analogously to the occurrence of free choice ***any***.

Why are the sentences in (b) above possible, though, whereas the similar ones given below are not?

(17) a. *Er hat verstanden, **ob** sie auch ihn eingeladen hat.
he – has – comprehended – if – she – also – him – invited – has

b. *He comprehended **if** she invited him, too.

(18) a. *Er hat sich erinnert, **ob** er schon mal Dostojewski gelesen hat.
he – has – himself – reminded – if – he – already – once – D. – read – has

b. *He recollected **if** he had read Dostojewsky.

The same verbs license UEQs under negative polarity:

(19) a. Er hat **nicht** verstanden, **ob** sie auch ihn eingeladen hat.
he – has – not – comprehended *– if – she –* also *– him –* invited *– has*

'He did not comprehend if she really invited him, too.'

b. **Hat** er verstanden, **ob** sie auch ihn eingeladen hat?
has – he – comprehended *– if – she – also – him – invited – has*

(20) a. Er hat sich **nicht** erinnert, **ob** er schon einmal Dostojewski gelesen hatte.
he – has – himself – not – reminded – if – he – already – once – D. – read – had

'He did not recollect if he had read Dostojevsky.'

b. **Hat** er sich erinnert, **ob** er schon einmal Dostojewski gelesen hatte?
has – he – himself – reminded – if – he – already – once – D. – read – had

We assume that sentences like (15b) are acceptable only under the *conventional implicature* (cf. Grice 1975) that the truth of the embedded clause is not evaluable by the attitude subject, in this case the hearer of the utterance. By using *if/ob* in this context, the speaker implies that the knowledge about the truth or falseness of the utterance does not belong to the *common ground*, i.e. the knowledge common to the speaker and the hearer.

Note that such an implicature is logically impossible in cases like (17) & (18), where the truth of the embedded clause is presupposed through the epistemic context. In fact, the matrix predicate and the use of *if* in the embedded clause yield two complementary presuppositions: that the truth of the embedded clause belongs to the common ground, on the one hand, and, on the other hand, that, in the common ground, it is (still) undecided whether the clause is true or not.

(21) a. He comprehended the utterance. ↮ He did not know if she invited him.

    b. He recollected his acting. ↮ He did not know if he had read
        Dostojewsky.

Adger & Quer (2001, 113f) suggest that the licensing of free choice items is syntactically constrained and that episodic tenses generally exclude them:

(22) #If an AIDS vaccine was synthesizable was discovered in 1998.

However, it is not episodic tense that immediately prohibits a free choice reading. The dating of the discovery is just the crucial factor making the attitude subject, in this case the individual uttering sentence (22), evaluate the embedded clause as true. Again, this is grounded on two complementary propositions implied by the matrix clause, on the one hand, and by the use of *if* in the embedded clause, on the other hand:

(23) The discovery was made in 1998. ↮ The discovery is unknown.

A similar case is the use of the first person as the subject of the matrix clause in the following sentence:

(24) I know *if/that I know nothing (or if I know something).

If the attitude subject is coreferent with the matrix subject, there are two complementary propositions implied, based on the truth-evaluability of the embedded clause:

(25) The speaker knows about his ignorance. ↮ Whether the speaker is
      ignorant or not is not evaluable by him.

This changes if the context implies the hearer to be the attitude subject: only then is an *if*-clause marginally licensed:

(26) ?I know if I know nothing, but I won't tell you.

What Adger & Quer (1997, 2001) call the 'free choice reading' of embedded formal interrogatives is very clearly not only restricted by the syntactic environment. It must also be possible to construct a context that implies the non-truth-evaluability of the embedded proposition.Consider:

(27) It is known that NASA admitted to the president **if** there is life on Mars or
      not. The public hasn't been informed yet, so that people still wonder if
      there is life on Mars.

Non-syntactically licensed UEQs are very much context dependent. Moreover, if there are only pragmatic reasons leaving the decision about the truth or falseness of the embedded clause open, the sentence is always grammatically marked. The selection of *if/ob*–clauses seems to be a function of verbal semantics plus either syntactic or pragmatic factors indicating that the embedded proposition is not part of the common ground. This strongly indicates that the solution of the problem of UEQs should be sought in the lexical semantics of the specific group of verbs licensing them, not in a syntactic property that they might select DPs. It

will be the second question of this paper, in which way the selection of *if/ob*-clauses by these predicates is formally licensed by the group of operators still left to be defined.

2.3   Factivity and Nonveridicality

We now turn to the semantic peculiarity of the verbs whose complements can be *if*-clauses in the scope of negative polarity. It is noteworthy that all verbs licensing UEQs that we have so far found are actually ***factive predicates***. Factive predicates embed *propositions the speaker presupposes to be true* (Kiparsky & Kiparsky 1970, 147). This is why, in contrast to non-factive verbs, factives, like in (28a), trigger factive presupposition of the embedded proposition:

(28) a. He *saw/ mentioned/ comprehended/ recollected/ regretted/ took into account/ deplored/* that the bartender was unhappy.

$(\rightarrow$The bartender was unhappy.)

    b. He *claimed/ uttered/ rejected/ assumed* that the bartender was unhappy.

$(\nrightarrow$The bartender was unhappy.)

Factive presupposition thus means that the truth of the embedded clause is evaluated as positive by the speaker.
Non-factives, like in (28b), are characterised by the attribution of a truth-value to the embedded clause through an utterative or putative act ascribed to the matrix subject evaluating the truth of the proposition. The truth-value cannot be presupposed by the speaker, however.

In contrast to implicative predicates (29a), where, under negation or interrogation, the presupposition is counterfactive or non-factive (cf. Karttunen 1971, 342ff), the presupposition of propositions expressed by the complement clauses of factives (29b) is not influenced by negative or interrogative operators (cf. Karttunen 1971, 340) – this means that the proposition, or the truth of the clause, follows from the common ground:

(29) a. He did not *achieve/ bring about/ make an effort/ . . .* that the bartender was unhappy. $(\rightarrow$ The bartender was not unhappy.)

    b. He did not regret/ take into account/ deplore that the bartender was unhappy. $(\rightarrow$ The bartender was unhappy.)

However, under the circumstances discussed in the preceding paragraphs, a notion like 'known to be true' (henceforth simply [+Tr]) is obviously replaced by a notion like 'undecided' (henceforth [±Tr]). If the embedded proposition does not belong to the common ground, the attitude subject – which can be either the speaker, or, by implicature (cf. 26 above), the hearer (or even both) – is not able to make a decision about the truth of the clause and therefore selects a specific

feature of clause mood from the lexicon. The result is the construction of an ***if***-clause.

In short, this means that, if the embedding predicate is factive but either of the potential attitude subjects does not know the truth value of the embedded clause, the speaker chooses the propositional set formation typical of interrogatives (see 2.4) instead of simply referring to a given proposition. In this case, the complementisers ***that/dass*** will be replaced by ***if/ob***, which are complementisers representing '*Q*' – an interpretable modal feature we suggest to be common to all clauses, including interrogatives, where the proposition cannot be assigned a truth-value due to propositional disjunction[9]. This effect can be illustrated by the factive epistemic verb *mention/ erwähnen*:

(30) Has everyone arrived?   (**interrogative, ±Tr**)

(31) a. He mentioned **that** everyone has arrived.   (**+Tr**)

  b. He did **not** mention **if** everyone had arrived (or not).   (**±Tr**)

  c. **Did** he mention **if** everyone has arrived (or not)?   (**±Tr**)

(32) a. Er hat erwähnt, **dass** alle angekommen sind.   (**+Tr**)
      he – has – mentioned – that – everybody – arrived – are

  b. Er hat **nicht** erwähnt, **ob** alle angekommen sind (oder nicht). (**±Tr**)
      he – has – NEG – mentioned – if – everybody – arrived – are

  c. **Hat** er erwähnt, **ob** alle angekommen sind (oder nicht)?   (**±Tr**)
      has – he – mentioned – that – everybody – arrived – are

The following random selection of predicates potentially licensing UEQs exclusively consists of *factive epistemics*:[10]

(33) ***Predicates licensing UEQs***

English: *mention, show, reveal, unveil, report, detect, find out, guess, say[11], realise, keep in mind, memorise, be clear, be known, notice, comprehend, know, recollect, see[12], . . . admit/ confess(?)[13];*

German (same order): *erwähnen, zeigen, verraten, aufdecken, berichten, ermitteln, heraus-finden, erraten, sagen, sehen, im Gedächtnis behalten, sich merken, klar sein, bekannt sein, merken, verstehen, wissen, erinnern, erkennen, . . . zugeben/ gestehen(?);*

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9   Cf. fn. 4.
10   Note that some of these verbs are ambiguous between factive epistemics and mere utterance verbs. Only in the former reading do the effects under discussion hold.
11   In the sense of '*mention*', not in the more general sense of '*utter*'.
12   In the sense of '*understand*', not in the more general sense of '*perceive*'.
13   cf. fn. 7 .

Thus, *factive epistemic predicates* allow, more or less dependent on polarity, formal declaratives and formal interrogatives as their complements. ***Non-epistemic factives*** cannot license *Q*; factivity is preserved under negation:

(34) a. Er hat es sehr bedauert, **dass** der Barmann unzufrieden war.   **(+Tr)**
          he – has – it – very – regretted – that – the – bartender – unhappy – was

      b. Er hat es **nicht** bedauert, **dass/*ob** der Barmann unzufrieden war.**(+Tr)**
          he – has – it – not – regretted – that/if – the – bartender – unhappy – was

With *implicative* verbs, *Q* is not licensed by negative polarity in the matrix either: the clausal objects become counterfactual under negation:

(35) a. Er hat es zustande gebracht, **dass** alle zufrieden waren.   **(+Tr)**
          he – has – it – achieved – that – everyone – satisfied – was

      b. Er hat es nicht zustande gebracht, **dass/ *ob** alle zufrieden waren. **(-Tr)**
          he – has – it – NEG – achieved – that/ if – everyone – satisfied – was

The reason why it is exactly the factive epistemic predicates which have this property is both intuitive and logical. *Knowledge* always refers to truth. Epistemic predicates are predicates over the truth of propositions. If they are non-factive, the truth is *claimed*, *assumed* etc. If they are *factive*, the truth is *presupposed*. If an operator like *NEG* scopes over a factive epistemic predicate, this must mean that the truth cannot be presupposed.

Knowledge of truth is twofold. If an attitude subject knows the truth of a proposition, he/she also knows whether the proposition is true or false. The truth of a proposition can be presupposed only in unambiguous contexts, however. An epistemic predicate presupposing a proposition if the truth-value is not available must yield ambiguity. If the truth is not presupposed, falseness is not necessarily presupposed either. What is then presupposed is that both truth and falseness are logically possible. This effect must be manifested by structural consequences, namely the assignment of the feature *Q* to the embedded clause.

What constitutes *Q*, however? We propose a definition based on a concept of *nonveridical* operators, as used by Giannakidou (1998). Giannakidou (1998, 171f) notes that NPIs in English must be in the scope of nonveridical operators. Antiveridical operators constitute a proper subclass of the nonveridical operators:

(36) a. A propositional operator Op in a given context c is ***non****veridical* iff it holds that:
          $[[Op\ p]]_c = 1 \nrightarrow [[p]]_c = 1$

      b. A nonveridical operator is ***anti****veridical*, iff it holds that:
          $[[Op\ p]]_c = 1 \rightarrow [[p]]_c = 0$ Giannakidou (1998, 106ff)

NPIs in English (which, according to Adger & Quer 1997, 2001, share the licensing properties with UEQs) are *anti-licensed by veridicality* (cf. Giannakidou 1998, 171f).[14] Only a *nonveridical* marker can license the NPI ***any***:

(37) Linguistics is *(**not**) any hobby.

In our view, syntactic features[15] like *Q* or *NEG* represent lexical entries for specific logical functions (i.e. nonveridical operators[16]). They operate on different kinds of variables and mark them as indefinite or negative. If a proposition does not belong to the common ground – which means there is no knowledge about its truth or falseness – this can be formally represented by *Q* operating on the truth variable $\mathbb{B} = \{0,1\}$[17]. If a clause or sentence is known to be false, a *nonveridical operator* will be used.

In a model of minimalist syntax, *Q* will have a corresponding formal feature in the C-System. We suggest that there is an interpretable feature *Q* in a specific modality head Mod° in the C-System (Force° in terms of Rizzi 1997; Typ° in Grewendorf 2002; Mod° in Öhl 2003). It directly represents the nonveridical operator operating on the truth variable.

Note that NPIs are licensed only in the part of the structure syntactically c-commanded by the operator. This is why sentence negation does not license an NPI subject:

(38) a. Linguistics is not any hobby.

b. *Any hobby is not like linguistics.

In *Y/N*-interrogatives, however, NPIs are possible even in subject position:

(39) Is there any hobby like linguistics?   ↛ There are (no) hobbies like linguistics.

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[14]   This means that NPIs definitely do not appear in veridical contexts, but it does not mean that they necessarily do appear in all nonveridical ones. This difference will become important in §2.5 and is explained at the end of §3.3.

[15]   We want to emphasise that, in our view, these interpretable features represent logical primitives and are not just syntactic markers. Just as *NEG* has diverse lexical representations in items like ***not, no***, ***never***, ***none*** and ***nothing***, *Q* also has them in words like ***possibly*** and ***how***. Both features also have their reflexes in morphology. *NEG* can be lexically expressed by prefixes:

(i) **un**known, to **de**valuate

Q is an F neutralising the presupposition of what is in its scope. It can be expressed in I°, in German syntactically represented as *conjunctivus potentialis*:

(ii) Er behauptet, er **habe** es gewusst.   ↛   ⟦ He knew it ⟧   = 1
*he – claims – he – has*SBJ *– it – known*

So can *NEG*, represented as *conjunctivus irrealis***:**

(iii) Ich wünschte, ich **hätte** es gewusst.   → ⟦ I knew it ⟧   = 0
*I – wished – I – had*IRR *– it – known*

[16]   We concede that *Q* is not a propositional operator in Giannakidou's terms, since it does not form propositions but sets of propositions (out of propositions).

[17]   Pafel (1997, 310f; 1999) also assumes that a specific function operates on the truth variable in interrogative clauses.

It can be concluded that a nonveridical operator higher than IP changes the polarity of the whole proposition in interrogative clauses. Since sentence negation is interpreted through a process like inheritance of negative polarity by the root node[18], and not through structural c-command of S by *NEG*, an NPI is not licensed as a subject in negated sentences. The prototypical *antiveridical* operator *NEG* inverts the polarity only below NegP.

Q in Mod° of embedded clauses is lexically represented by ***if/ob.*** Complementisers like ***if/ob*** are not, in the first place, markers of embedded interrogative clauses, but lexical representations of the nonveridical operator blocking the assignment of a truth value. Therefore, *if*-clauses also occur as complements of predicates like *doubt, forget, be the same, matter* etc. Even though they are not logically interrogative, their complements refer to propositions without truth-values:

(40) a. Most people doubt **if** there is life on Mars.

b. NASA forgot **if** there was life on Mars.

c. To many people it is all the same **if** there is life on Mars or not.

d. In fact, it matters **if** there is life on Mars or not.

This property is exactly what these predicates share with interrogative ones.

Positive Evidence for an independent nonveridical operator in the C-system comes from Persian. In languages like English, the operator is realised syntactically by T-movement in root interrogatives. Languages like Persian have particles locally lexicalising it instead:

(41) ***āyā*** ān pesar zabānšenāsī mīxānad?   (Ahmad R. Lotfi, p.c.)
     Q – DEM – *boy – linguistics – study*-3rdsg

'**Does** this boy study linguistics?'

If ***āyā*** is the lexical entry for the nonveridical operator of propositional disjunction, it is predicted that Persian has UEQs marked by ***āyā***. This prediction is borne out: the particle is employed both in selected interrogatives (42a) and in UEQs (42b+c):

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[18]   Cf. Öhl (2003, 80ff) on LF interpretation by means of inheritance. Alternatively, one can assume that the feature representing sentence negation is actually generated in a head Neg° in the C-system, thus c-commanding the whole proposition. Evidence for a NegP in the C-domain is found in other languages, too, e.g. Greek (cf. Roussou 2001). If the negative element is generated in a lower domain, one has to assume movement or chain formation, such that the scope of NEG can be interpreted at LF. In this case, an additional explanation is necessary as to why NPIs must be licensed before spellout.

(42) a. ū porsīd **ke āyā** man zabānšenāsī xānde būdam.
     he/she – asked – SUB[19] – Q – I – linguistics – studied – had

     'He/she asked if I had studied linguistics.'

   b. (man) nemīdānam **ke āyā** ū zabānšenāsī mīxānad.
     I – NEGknow – SUB – Q – he/she – linguistics – studies

     'I do not know if he/she studies linguistics.'

   c. ān nešān na-dād **ke āyā** xošhāl-e yā nā.
     DEM – show – not-give – SUB – Q – happy-is – or – not

     'He/she did not show if he was happy or not.'

The particle **āyā** does not mark clauses as interrogatives, but as disjoined propositions[20], as do **if/ob** in English and German.

2.4   Nonveridicality, Propositional Disjunctivity and Interrogative Interpretation

According to accounts like those of Hamblin (1976) or Karttunen (1977), the semantics of interrogatives is logically equivalent to the set of possible answers to the corresponding questions. A simple question like 'Is it raining?' would be notated in Hamblin-semantics as:

(43) a. Is it raining?   (cf. Hamblin 1976)

   b. $\lambda p\ [\ p = \text{rain} \lor p = \neg\text{rain}\ ]$

---

[19]   Note that Persian uses a neutral marker of syntactic subordination **ke** in embedded clauses:

   (i) man dīdam **ke** ān pesar zabānšenāsī mīxānad.
       I – saw – SUB – DEM – boy – linguistics – studies
       'I saw that the boy studied linguistics.'

   It is also employed in embedded **āyā**-clauses, which constitutes direct evidence for a split CP consisting of more layers than proposed by Rizzi (1997). The data suggest that, above the phrase where the *Q*-particle is generated, there is another one hosting the complementiser. Whereas **āyā** is the lexical entry for the head carrying *Q*, **ke** is the lexical entry for a feature of syntactic subordination. Therefore, Öhl (2003, 2006) proposes that, in embedded clauses, there is not only one ForceP, like in matrix clauses, but rather a CP dominating another functional phrase hosting the features of clause mood. In these terms, the *Q*-particle **āyā** is in Force° only in matrix clauses. In embedded clauses, the CP headed by the complemetiser **ke** dominates a phrase like ModP, headed by **āyā**. A similar account was given by Roussou (2000) based on Greek data. Note that Rizzi (2004) introduces an IntP below ForceP in order to account for the asymmetric distribution of the declarative and the interrogative complementiser in Italian. Rizzi (1997, fn. 6) also concedes that there may be subordinators above ForceP. In systems allowing syncretic functional heads (Giorgi & Pianesi 1997; Öhl 2003; Bayer 2004), complementisers like **if/ob** may be lexical entries for a complex such as [SUB+*Q*].
   [20]   Note that interrogatives introduced by the particle *āyā* in Persian have been reanalysed from constructions with the disjunction *yā* (cf. Korn & Öhl 2006).

    c. {it is raining; it is not raining}

This means a logical function forms a set of two complementary propositions. The same must be true for embedded interrogatives:

(44) a. He wondered **if** it was raining.

      b. He saw **that** it was raining.

A *that*-clause always refers to one proposition that can be either true or false. An *if*-clause has the potential to refer to two propositions by means of a specific function. This function is also syntactically represented. In many models (e.g. Stechow 1993, 77), it is assumed that a question-operator operates from SPEC/C in interrogative clauses. In our account, a nonveridical function can be represented in the syntax as the feature Q in Mod°. This function is a logical operator, even if it is a syntactic head.[21]

Thus, a matrix clause is interpreted as a *Y/N-interrogative* due to a nonveridical operator in the C-System. Subordinate clauses introduced by ***if/ob*** contain the same operator, but are not, as such, interrogatives. We follow Bayer (2004) who argues that the term '*embedded question*' is misleading. Embedded 'interrogatives' do not *denote* questions – it is just that they may *refer* to questions, because their C-system contains the feature of propositional disjunction (Bayer 2004, 66). This feature not only marks embedded clauses referring to questions, but all propositions that are disjoined due to the syntactic context (or, in the case of the marked 'free choice' reading of *if*-clauses, the epistemic context).

2.5   Other Nonveridical Markers

UEQs occur in many more contexts than those of negative polarity. Note that future tense and future interpretation must license the ***if*-**clauses in (45a-c), otherwise the sentences should be as marked as the ones in (45d+e):

(45) a. She is in bad odour with me today. Now I **will** see **if/** ?**that** she has an *agreeable* character.

      b. Today it will be revealed **if/** ?**that** she has an *agreeable* character.

      c. Now it is becoming clear **if/** ?**that** she has an *agreeable* character.

      d. Now it is clear ?**if/ that** she has an *agreeable* character.

      e. She was in bad odour with me recently. Then I **saw *if/that** she had an *'agreeable'* character.

---

[21]   cf. Brandner (1994: 163): the complementiser '**if** is a syntactical head but also a semantical operator'; compare also Adger & Quer (2001: 124); Öhl (2003: 250).

(46) a. Heute ist sie schlecht auf mich zu sprechen. Jetzt werde ich sehen, **ob/** ?**dass** sie einen *angenehmen* Charakter hat.

 b. Heute zeigt sich, **ob/** ?**dass** sie einen *angenehmen* Charakter hat.

 c. Im Moment wird klar, **ob/** ?**dass** sie einen *angenehmen* Charakter hat.

 d. Jetzt ist klar, ?**ob/ dass** sie einen *angenehmen* Charakter hat.

 e. Neulich war sie schlecht auf mich zu sprechen. Da sah ich, ***ob/ dass** sie einen '*angenehmen*' Charakter hatte.

Since the matrix verb is factive, a ***that*-complement** presupposes *p*. In this case, however, the factive presupposition contradicts the epistemic context due to the 1st sg pronoun. Therefore, the ***that*-clause** is logically deviant. If the embedded clause is syntactically marked by ***if*/*ob***, the truth of the embedded proposition is not presupposed and the sentence is perfect, exactly as the corresponding sentences with negative polarity in their matrix are:

(47) a. Has it been revealed, **if** she has an agreeable character.

 b. Hat sich herausgestellt, **ob** sie einen angenehmen Charakter hat?

Complement clauses of factive epistemics must be *potentially* true if *Q* is not formally licensed. This is most obvious in (45e), where the past tense formally excludes *Q* in the complement. Here, the use of *agreeable* in the complement clause can only be interpreted as ironic. The limiting value for the licensing of *Q* seems to be present tense. In (45c), the durative terminative reading implies the posterior fixing of the truth-value, and *Q* is licensed. If present tense cannot be interpreted as future (45d), formal licensing of a *Q*-clause is blocked[22]. Future tense is a nonveridical function exactly like *Q* and *NEG* (cf. Giannakidou 1998, 138):

(48) They will go to school. $\nrightarrow \exists t[t° < t \ \& \ go(t, they\text{-}to\text{-}school)]$ [23]

Since clauses carrying the feature *Q* in C are licensed in complement position of a factive epistemic verb if it is in the scope of a nonveridical operator, nonveridical tense (i.e. *future*), nonveridical mood (i.e. *irrealis* and *potentialis*), and also epistemic and deontic *modals* and *habitual* or *generic reading* must be logical operators (Öhl 2003, 268):

(49) a. We **will** see **if**/whether this is right.

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[22]   The grammaticality of an ***if*-clause** can be rescued by the conventional implicature that the clause still refers to a question. In this case, the sentence is stylistically marked, however.

[23]   Therefore propositions in the future tense are not easily embedded by many factive predicates. In fact, the implicature of deontic modality in the SubC is necessary, which is then interpreted as +Tr:

 (i) ?? They realise/ report/ are shocked, that they will (~must) go to school tomorrow.

    b. I **wished I knew if**/whether the kids sometimes play truant.

    c. It **seems** he knows already **if**/whether the Socks won the match.

    d. He **must** reveal **if**/whether he has played all trumps out.

    e. Professors notice **if**/whether the students tell the truth.

(50) a. Es wird sich zeigen, **ob** das stimmt.
it − will − itself − reveal − if − this − true-is

    b. Ich wünschte ich wüsste, **ob** die Kinder manchmal die Schule schwänzen.
I − wish-IRR − I − know-IRR − if − the − kids − sometimes − the − school − shirk

    c. Es scheint als wisse er schon, **ob** Bayern das Spiel gewonnen hat.
it − seems − as − know-SBJ − he – already – if − B. − the − match − won − has − or − not

    d. Er muss zeigen, **ob** er noch einen Trumpf auf der Hand hat.
He − must − reveal − if − he − still − a − trump − on − the − hand − has

    e. Professoren merken, **ob** ein Student die Wahrheit sagt.
professors − notice − if − a − student − the − truth − says

It can be concluded that, in all of these cases, a modal feature like Q, in the I-system of the matrix, licenses Q in the CP of the embedded clause – this again blocks the assignment of a truth-value to the embedded proposition.

This raises the question of why nonveridical types of inflection do not license negative polarity items. As stated above (§2.3), not all nonveridical markers necessarily license NPIs in the domain of their scope. In the following section, we will investigate the structural properties of sentences with UEQs. We will also introduce and explain the concept of *well-formed syntactic dependencies*. This will yield an answer to both the question of why only a subgroup of the nonveridical markers license NPIs and how the selection of complements by factive epistemic predicates like *notice* can be constrained by external factors.

3 Modal Features, Well Formed Dependencies, and Argument selection

3.1 Selection or Licensing? UEQs and German Complex Predicates

One method of reconstructing the way in which modals and similar elements are able to influence s-selection is by looking at German *coherent infinitive constructions*. Indeed, coherent infinitives 'select' Q in embedded clauses under certain circumstances, where incoherent ones do not. If the prospective imper-

sonal verb *versprechen* ('promise') is combined with a factive epistemic verb, a selected clause is obligatorily marked by *Q*, even if the matrix is in the past tense. Without *versprechen*, the V has a ***that***-clause as its complement. An ***if***-clause would be ungrammatical:

(51) a. Es hatte sich herauszustellen versprochen, ***dass/ ob** etwas an der
          Sache dran war.
          it – had – promised – to – turn-out – that/ if – something – on – the –
          thing – on-there – was

          'It had promised to turn out **if** the deal had substance'.

      b. Es stellte sich heraus, **dass/** *ob etwas an der Sache dran war.

Obviously, the complex of the prospective verb *versprechen* and the factive epistemic predicate *herausstellen* ('turn out') behaves like a simple predicate selecting a non-truth-evaluable clause.

   Predicates are functions applied to individuals. A complex predicate is the combination of two functions, or better, the application of a function to a function. Their product may have a selectional frame different from that of either single predicate. In the case in question, this leads to 's-selection' of *Q* instead of an unmarked CP.

   Obviously, it plays a crucial role whether the modal operator forms a complex with the epistemic predicate or not. This is indicated by the following modal verb construction:

(52) a. [_{VP} Sicher sein, **dass/** ?ob das stimmt], sollte es erst einmal schon.
          certain – be – that – if – this – is-true – should – it – first – once – yet

          'That this is true should be certain, first.'

      b. **Ob** das stimmt, hat erst einmal [sicher sein sollen].
          EXPL *– has – first – once – certain – be – shall – if – this – is-true*

          'First, it should be certain if this is true.'

In (a) above, there is a topicalised VP-predicate containing the factive epistemic predicative *'sicher'* with a CP complement. It does not contain a nonveridical operator, thus, in the unmarked case, the complement is a CP evaluated as true. The incoherent reading is forced by the obligatory right-adjacency to V° of a CP-argument in the *Vorfeld*. It prevents the reconstruction of the predicate complex. If the same CP is complement of the complex predicate in (b), where the modal functions as a nonveridical operator, it will be marked as non-truth-evaluable.

   The topicalisation of the ***ob***-clause does not influence its grammaticality. This shows that c-command of the object clause by the nonveridical operator is not the crucial factor for licensing *Q* in C. Instead, it is crucial that the predicate

represents or contains a nonveridical function[24]. In the following subsection, we will show that this analysis can be extended to the licensing of UEQs through *NEG*.

3.2   Coherently Negated Predicates

Frege (1923-26) has already taken negation as an example for compositional meaning. It is crucial that negation is a function that can be applied either to a proposition or to a predicate:

(53) a. wahrscheinlich hat er kein Verkehrsschild erkannt   (sentence negation)
        probably – has – he – no – traffic-sign – recognised

        → An event of recognition has not taken place.

    b. wahrscheinlich hat er ein Verkehrsschild [nicht erkannt]   (predicate
        probably – has – he – a – traffic-sign – not – recognised   negation)

        → An event is documented, where a sign was not recognised.

The logical difference between the two kinds of negation is that only sentence negation inverts the truth-value of the whole proposition to 0. It clearly operates directly on the truth value. In contrast, the direct (narrow) negation of V (which is logically equivalent to lexical negation or antonymy, see below) describes an event or a circumstance where the opposite of the event denoted by the predicate is true. The proposition as a whole still has a positive truth-value.

A puzzling asymmetry in the selectional properties of negated factive epistemic predicates follows from this fact. If the position of the negation particle *nicht* is ambiguous, both **dass** and **ob** are possible:

(54) Es ist nicht sicher, dass/ ob das stimmt.
    it – is – not – certain – if – this – is-true – or – not

This structure can be disambiguated by an intervening adverbial, which automatically leads to the ungrammaticality of an **ob**-clause:

(55) Es ist nicht [schon seit jeher] sicher, **dass/** *ob das stimmt.
    it – is – not – already – since – ever – certain – that – this – is-true

If the adverbial precedes *NEG*, **ob**-clauses become the strongly preferred option:

(56) Es ist [schon seit jeher] nicht sicher, **ob/**?dass das stimmt.
    it – is – not – already – since – ever – certain – if – this – is-true

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[24]   In fact, we assume that predicates selecting Q are always complex – be it lexically (e.g. ASK) or syntactically (e.g. [TURN-OUT]PROMISE).

Predicate negation of factive epistemics seems to directly license **ob**. This is also suggested by the fact that their antonyms, which should be logically identical with the negated predicates, have **ob**-clauses as their complements:

(57) a. Es ist wirklich unsicher, **ob**/*dass das stimmt.
         it – is – really – uncertain – if – this – is-true

     b. [$_{V'}$ un-V [$_{CP}$ ob . . .]]

NEG is interpreted as predicate negation if it is topicalised together with the predicate. This also forces selection of an **ob**-clause:

(58) [nicht sicher] ist, *dass/ **ob** das stimmt (oder nicht).
     not – certain– is – if – this – is-true – or – not

Paralleling this property to that of the coherent infinitives discussed above, we suggest that selection of either a **dass**-clause or an **ob**-clause depends on whether negation takes place before or after selection. Compare:

(59) a. gezeigt [**dass** das stimmt] hat er eigentlich nicht
         shown – that – this – is-true – has – he – actually – not

     b. *nicht gezeigt [**dass** das stimmt] hat er stattdessen eigentlich
         not – shown – that – this – is-true – has – he – instead – actually

     c. nicht gezeigt [**ob** das stimmt] hat er stattdessen eigentlich
         not – shown – if – this – is-true – has – he – instead – actually

     d. ?gezeigt [**ob** das stimmt] hat er eigentlich nicht
         shown – if – this – is-true – has – he – actually – not

The potential base positions of *NEG* in correlation with s-selection are indicated by the potential constellations in the *Vorfeld*. In (59a+d), the object clause is the immediate sister to V°, which means that it is selected before negation. In (59b+d), the object clause is sister to the complex [*NEG*[V]]. Since (59b) is ungrammatical, it is obvious that predicates like [*NEG*[ZEIG]] select *Q*, exactly as predicates like [ASK] do. We assume that, in this case, *NEG* is inserted into the syntax as a head forming a complex predicate with V°. We suggest calling this '*coherent negation*'. Only if *NEG* forms a constituent with V can it be interpreted as immediate predicate negation with narrow scope over V. And only then does it modify 's-selection'.

     Further evidence for the effect of negation scope is that **ob**- and **dass**-clauses cannot be coordinated when the **ob**-clause precedes the **dass**-clause. If it follows it, there is no ungrammaticality effect, but it gets the marked 'free-choice-reading'. It must be pragmatically implied that the truth-value is in question:

(60) a. *Er hat nicht verraten, **ob** er das Buch gestohlen hat und **dass** er es gut findet.
         he – has – not – revealed – if – he – the – book – stolen – has – and – that – he – it – good – finds

b. Er hat nicht verraten, **dass** er das Buch gestohlen hat und **dass/** ?**ob** er es gut findet.
he – has – not – revealed – that – he – the – book – stolen – has – and – that/if – he – it – good – finds

The explanation must be that, in the case where the ***ob**-clause comes first, it fixes the reading to coherent negation, thus the **dass**-clause is ungrammatical. If **dass** comes first, *NEG* is interpreted as sentence negation, and **ob** can only be licensed pragmatically. The same is true if V° is gapped below *NEG*, such that *NEG* must be interpreted as sentence negation:

(61) Er hat verraten, **dass** er das Buch gestohlen hat, und nicht, **dass/** ?ob er es gut findet.
he – has – revealed – that – he – the – book – stolen – has – and – not – that/if – he – it – good – finds

Structural licensing of *Q* can also be blocked by parenthesis, which presumably may not intervene within the verbal complex:

(62) a. Er hat nicht – wie wir ja wissen – gezeigt, **dass/** ?ob das stimmt
he – has – not – as – we – well – know – shown – that – this – is-right

   b. Er hat – wie wir ja wissen – nicht gezeigt, dass/ ob das stimmt
he – has – as – we – well – know – not – shown – that – this – is-right

Thus, the function *NEG* can be applied to a predicate at (at least) two degrees of saturation.[25] The formation of the complex [*NEG*[V]], V a factive epistemic predicate, produces a predicate selecting a clause with the property [±Tr]. The different effects of sentence negation and predicate negation on CP-selection is made explicit in (63):

(63) a. He did not show **that** this was right (*or not).

   → It is **not** true that he showed that this was right.

   b. He did not show **if** this was right (or not).

   → It is true that he did **not** show if this was right.

In §3.4, we will show that the whole analysis can be extended to English, even though English apparently does not have coherent negation. Of course, it is debatable whether it is appealing to have complex predicates 's-selecting' arguments. However, if we replace the notion of s-selection by *formation of syntactic dependencies*, the distinction of lexically and syntactically complex predicates will cease to be problematic.

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[25]   Note that Kemenade's (2000, 60) explanation of the reanalysis of the negative particle *ne* in Old English requires a NegP to the right of the objects in a language with OV order. Maybe the adjacency requirement of negation to V for UEQ-selection can be seen as independent evidence for such a low generation site for negative particles.

3.3   *Q*-Selection and the Modal Dependency

It is a commonplace in generative theory that, as the inventory of interpretable features in the lexicon and their mapping to semantic representations should be universal, sentences with identical informational content are structured with identical interpretable features:

(64) **LF-interpretation** (Öhl 2003, 135; ad. from Roberts & Roussou 2002, 132)

    The inventory of interpretable features in the Lexicon is universal. They are mapped to universal semantic representations on LF.

Thus, the PF-output should be analysed as an idiosyncratic way of mapping the hierarchical syntactic representation LF to a linear string of phonetic symbols:

(65) **PF interpretation**   (Roberts & Roussou 2002, 132)

    Structural descriptions of relations between features in a syntactic unit are idiosyncratically realised on PF.

The way features are related in a syntactic unit can be described in terms of syntactic dependencies forming chains:

(66) **PF-interpretation**   (adapted from Roberts & Roussou 2002, 132)

    PF-interpretation applies to structural descriptions of relations between features in a syntactic unit, i.e. chains in a syntactic dependency that are idiosyncratically realised on PF.

Sportiche (1998, 388ff) lists 11 kinds of syntactic dependencies, among them *s-selection, quantifier-scope*, and the licensing of *polarity items*. He defines a dependency as a *binary relation between two syntactic items that are in some structural relation of command*:

(67) a. D is a binary relation D(x,y).   (Sportiche 1998, 389)

    b. One of (x,y) must command the other.

Following Manzini (1995), Roberts & Roussou (2002, 128) state the well-formedness conditions for syntactic dependencies, which we reproduce in a simplified version:

(68) **(α, β) is a WFD iff:**   (Öhl 2003, 66; cf. Roberts & Roussou 2002, 128)

    i. α asymmetrically c-commands β;

    ii. α and β share at least one type of features that belong to a natural class.[26]

    iii. Minimality is respected.

For a WFD to be interpretable at LF, it must fulfil the condition of compatibility of its members:

(69) *Interpretability of Dependencies*   (Öhl 2003, 67)

    i. there is a set of features $\{F_i \ldots F_k\}$ of the type F and

    ii. α and β are co-members in a WFD by means of F,

        $\Rightarrow$ F_α and F_β must be compatible[27].

Assuming that specifiers are specific lexicalisations of features in a functional head, we can interpret a syntactic dependency as a structural relation between two (or more) heads. Roberts & Roussou (2002) suggest that temporal relations between the domains of C, I and V of a sentence are computed by means of a tense dependency. Öhl (2003, 137ff) extends this analysis to syntactic embedding: there is a WFD between the (tensed) matrix verb and C, I and V of the embedded clause, making possible the computation of tense of the complement in relation to the matrix.

    We assume that, much like the *tense dependency*, a modal chain links modal features in C, I and V. Manzini (2001) argued before that this is the case when negative operators, question operators, and conditional operators trigger the subjunctive in Italian subordinate clauses:

(70) a. Non sa che io sia andato.   (cf. Manzini 2001: 241f)
       NEG – *know* – COMP – *I* – AUX-SBJ – *gone*

       'He does not know whether I have gone.'

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[26]   We concede that it is not easy to give an abstract definition of 'natural classes' of interpretable features. However, it should be intuitive that there are certain groups of features that can be defined according to the entities they denote, e.g. features of tense that relate predications to points or intervals of time. We take the natural class of *modal features* to relate predications to possible worlds.

[27]   What we call compatibility might also be expressed in terms of *feature sharing*, which is analysed as the basis of *agreement* by Pesetsky & Torrego (2004):

    Agreement and Feature Sharing   (adapted from Pesetsky & Torrego 2004, 4)

    An unvalued feature at syntactic location α scans its c-command domain for another instance of the feature at location β with which to agree. Replace F_α with F_β, so that the same feature is present in both locations.

    It is not clear at all, however, if feature sharing, as defined here, may explain the well-formedness of all kinds of syntactic dependencies.

b. Sai che lui sia andato?
    know – COMP – *he* – AUX-SBJ – *gone*

    'Does he$_1$/she know whether he$_2$ has gone.'

c. Chi sai che sia andato?
    who – *know*-2ndsg – COMP – AUX-SBJ – *gone*

    %'Who do you know if has gone?'

d. Se sai che lui sia andato…
    if – *know* – COMP – *he* – AUX-SBJ – *gone*

T is indeed spelled out as subjunctive when it forms a dependency with an operator of the relevant kind (Manzini 2001, 243). It has further already been noted by Adger & Quer (2001, 110f) that, in some Romance languages, UEQs can alternatively be marked by a neutral complemetiser and the subjunctive. Since we assume that the subjunctive is an I-reflex of a nonveridical operator (see above fn. 15), this does not come as a surprise. I of the embedded clause is co-member in the nonveridical dependency. If there is a chain like [NEG –V – C – T^{SUBJ} - …], one can conclude that Q in the embedded clause may parametrically be represented by subjunctive inflection.

Although embedded CPs may *a priori* be selected by the matrix verb, C of the complement clause can be a member of a WFD *a posteriori*, depending on the class of the matrix predicate and its potential membership in this specific WFD. We will argue, in §3.4, that factive epistemic verbs can become co-members in a Q-dependency by means of an incorporated polarity sensitive head π, such that this dependency constrains the selection. *Selection* is a specific case of establishing a WFD. Just as there is a dependency between Q in the embedded clause and verbs like ASK, however, there can also be one between embedded Q and a predicate that has incorporated the polarity sensitive head π which is licensed by a nonveridical operator in the matrix.

Thus, complementation may not only be constrained by the lexical features of the matrix predicate, but also by features c-commanding it within the WFD. Just as the tense dependency of the matrix clause has C of the embedded clause as its co-member through tense-binding by the matrix verb, a matrix verb that is co-member in a nonveridical dependency 'modality'-binds C of the subordinate clause such that it licenses Q in C of the embedded clause.

Even if one were find a way to license Q in embedded C pragmatically, we still think it holds that dependencies must, in general, be recoverable by a PF-interpretation. If they are not, they are grammatically marked. The interpretation always applies to the head of the dependency, i.e. the topmost feature that is phonologically identified:

(71) ***Recoverability of Dependencies***   (ad. from Roberts & Roussou 2002, 132)

In a dependency $\Delta = (\alpha_l ... \alpha_n)$, where a lexicalised feature α_j asymmetrically c-commands all features $\alpha_k - \alpha_n$, Δ must be interpreted as an α_j-dependency.

This is why a nonveridical operator constrains the modality of the embedded clause only if it heads a *Q*-dependency mediated by a polarity sensitive head π. Lower members of a head-dependency can lexicalise the feature heading the dependency if it is not lexically specified for autonomous PF-realisation. That is why languages without *Q*-particles front I or V to C in order to PF interpret the *Q*-dependency.

Selection of a clause is nothing more than the binding of C by the matrix verb, and it links the dependency of the complement to the dependency of the matrix clause. Thus there is no substantial difference between the structural descriptions of so-called UEQs and selected interrogatives – their modal features are always licensed through co-membership in the *Q*-dependency. In the case of lexical selection, the *WFD* consists of only two members – the lexically interrogative matrix verb and *Q* in C of the embedded clause:

(72) $[_{CP}$ Ich $[_{C'}$ habe $[_{VP}$ mich gefragt$_i$, $[_{CP}$ ob$_i$ $[_{VP}$ er kommen wird $]\cdots]$
I – have – myself – asked – Q – he – come – will

$\Rightarrow$ *Q* of the complement is licensed by a WFD with the matrix verb

The concept of *WFD*s also allows us to explain why not all nonveridical operators license NPIs: only operators that are in a dependency relation with a syntactic object can also license it. That nonveridical T-elements license π but not XPs in their scope must mean that they cannot establish a dependency relation with them.[28]

In the next subsections, we explore the way in which a *WFD* can be established between *Q* in the C-System of the embedded clause, the matrix verb, and a nonveridical operator c-commanding it, thereby justifying our assumption of the incorporation of the polarity sensitive head π.

3.4   The polarity sensitive head π

If we want a dependency with higher operators to license the variation of the selectional properties of factive epistemic predicates, these predicates must, in some way, be accessible to these operators. It must be a lexical property of this

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[28]   One can speculate that the relevant criterion is the kind of variable the operators quantify over. I-operators quantify over predicates or propositions (the time variables respectively), but not over referents. This may be syntactically reflected by the fact that they can be in a dependency relation only with V and C, but not with XPs.

class of predicates which makes the potential ambiguity under nonveridicality syntactically computable. They must be endowed with a *variable that can be bound by nonveridical operators*.

What is still striking is that, in all cases of nonveridical operators scoping over factive epistemics, the selection of a non-truth-evaluable clause is optional. If a ***that***-clause is selected, the presupposition is, of course, factive.

(73) a. He did **not** notice **that** everyone had arrived.   **(+Tr)**

    b. **Did** he notice **that** everyone had arrived?   **(+Tr)**

(74) a. Er hat **nicht** gemerkt, **dass** schon alle da waren.   **(+Tr)**
         he – has – NEG – noticed – if – already – everybody – there – was

    b. **Hat** er gemerkt, **dass** alle da waren?   **(+Tr)**
         has – he – noticed – that – already – everybody – there – was

This is why we propose that the formal representation of this variable is an optionally incorporated polarity sensitive head π that is bound and licensed by the nonveridical operator. This head turns the predicate from a factive one into a predicate selecting a set of two disjoined propositions. π is structurally licensed by its co-membership in a nonveridical dependency.

Note that a predicate in the scope of a nonveridical operator would always select an *if*-clause if this predicate was lexically endowed with a head like π. It is just that the lexical properties of factive epistemics include the ability to incorporate a polarity sensitive head syntactically. Only then do they form a *WFD* with the higher nonveridical operator. Since both operator scope and selection are, in fact, instances of well-formed syntactic dependencies, the complex [π [V]] can have an *if*-clause as its complement. An *if*-clause, however, is nothing more than a proposition that is marked by another nonveridical operator represented by *Q* in C. Thus, π makes the *WFD* possible between *Q* or *NEG* in the matrix and *Q* in the embedded clause.

Embedded *Q* is licensed by [π [V]] through the selection dependency. π, however, is licensed through operator binding. The whole dependency is well-formed due to the compatibility of the modal features according to the conditions formulated in (69). Note that this implies that complementation is not a process of lexical selection, but rather of syntactic licensing of properties of the complement, which is compatible with an account of incremental structure building.

As shown above (cf. §3.2), in languages like German, a nonveridical operator can be directly incorporated in the verbal complex instead of a polarity sensitive head. However, if we assume that licensing *Q*-clauses relies on a head like π, this raises the possibility that licensing of *Q* by *NEG*, in all languages, is as local as is made transparent by German syntax. It is just that it is obscured by PF in languages, like English, where the phonological representation of negation has its specific position in NegP. Nevertheless, *NEG* can have either wide or

narrow scope, where narrow scope over a factive epistemic verb licenses an *if*-clause:

(75) a. Julie did not mention **that** the bartender was unhappy.

> *'It is not true that Julie said that it was true that the bartender was unhappy.'*

   b. Julie did not mention **if** the bartender was unhappy.

> *'It is true that Julie did not say whether the bartender was happy or not.'*

Since negation in English is bound to the specific functional projection NegP, the interpretation is not configurationally transparent. We assume structures like:

(76) a. Maria hat [**nicht** erwähnt] **ob**$_i$ der Kellner unzufrieden war.
    Mary – has – NEG – mentioned – if – the – barkeeper – unhappy – was

   b. Julie did [$_{NegP}$ **not**$_i$ [$_{VP}$ [**π**$_i$ [mention]] [**if**$_i$ the bartender was unhappy]…]

Thus, there is a dependency [Op^Q – [π [V – [Q . . .]]]] in English. This assumption is supported by the fact that antonyms of the class of predicates incorporating **π** show the same alternation of s-selection both in English and in German:

(77) a. Er hat verschwiegen/ nicht erwähnt, **ob** Hugo unten vor der Tür stand.
    he- has – kept-secret/ – not – mentioned – if – H. – downstairs – before the – door – stood

   b. He kept secret/ did not mention, **if** H. was standing downstairs in front of the door.

(78) a. **Ob** das stimmt, ist **nicht** gewiß/ **un**gewiß.
    if- this – is-true – is – not – certain/ – uncertain

   b. If this is right, is **not** certain/ **un**certain.

As predicted by our assumptions, antonyms of verbs that do not license UEQs under narrow negation have *that*/*dass*-complements:

(79) a. Er bedauert nicht/ begrüßt, **dass**/ *****ob** Hugo unten vor der Tür steht.
    he – regrets – not/ – appreciates – that/ if – H. – downstairs – before the – door – stands

   b. He does not regret/ appreciates that/ *if H. is standing downstairs in front of the door.

(80) a. Es ist nicht wahrscheinlich/ unwahrscheinlich, **dass**/ *****ob** das stimmt.
    it – is – not – probable/ – improbable – if- this – is-true

   b. It is not probable/ improbable that/ *if this is true.

Like in English, distant binding of **π** also applies to German interrogatives:

(81) a. $[_{CP+Q} \boldsymbol{Q}_i$-did $[_{IP}$ he $[_{I'} e_i [_{VP} [\boldsymbol{\pi_i} [\text{mention}]] [_{CP+Q} \textbf{if}_i [\text{ all of them will}$
come]···]

b. $[_{CP+Q} [_{C'} \boldsymbol{Q}_i$-hat $[_{VP}$ er $[_{V°} [\boldsymbol{\pi_i} [\text{gesagt}]] [_{CP+Q} \textbf{ob}_i [\text{ alle kommen werden}$
]···]
has – he – said – if – all – come – will

To sum up, we have shown that the occurrence of ***if/ob*** in embedded clauses basically reflects that the embedded proposition is non-truth-evaluable due to propositional disjunction. One might speak of 's-selection' of the feature *Q*, if the logical context given by the matrix blocks the assignment of a truth value to the embedded proposition. *S-selection* is a specific case of a well-formed syntactic dependency. If *Q* is lexically selected, this means that the truth value of the embedded proposition is blocked by a lexical property of the matrix predicate. In this case, there is a modal dependency only between V° and the head in the C-system of the complement where *Q* is generated. If *Q* is selected by a factive epistemic predicate in the scope of a nonveridical operator, there can be a dependency between *Q* in the C-system of the complement clause and this operator, mediated by the polarity sensitive head $\boldsymbol{\pi}$ incorporated by the matrix predicate. German clauses where Neg°, a modal verb, or a nonveridical functional verb like impersonal *versprechen* ('promise') form a cluster with V (cf. §3.1, §3.2), constitute a special case where nonveridical operators directly represent a polar head in the complex predicate.

4   On the Specifity of *wh*-Clauses

4.1   *Q ≠ wh*

In this final section, we return to our statement that *wh* and *Q* are indeed two different kinds of features. This is the reason why the licensing of *wh*-clauses and clauses introduced by ***if/ob*** does not necessarily coincide. This assumption is contradictory to earlier assumptions in generative theory that all interrogatives, i.e. *wh*- and *Y/N*-questions, are marked by a *wh*-feature in the CP (cf. Brandt & al. 1992, 32f) or a *wh*-operator in SPEC/C (Stechow 1993, 77; Brandner 1996, 93ff).

As already noted by Fortmann (1994, 3), there are verbs that embed *wh*-clauses but not ***ob***-clauses in German:

(82) a. Hugo staunt, **wer** sich hier mit wem gegen ihn verschworen hat.
*H. – is-amazed – who – himself – here – with – whom – against – him –
conspired – has*

     b. Hugo staunt, **dass** sich seine Nachbarn gegen ihn verschworen haben.
        *H. – is-amazed – that – themselves – his – neighbours – against – him
        – conspired – have*

     c. *Hugo staunt, **ob** sich seine Nachbarn gegen ihn verschworen haben.
        *H. – is-amazed – if – themselves – his – neighbours – against – him –
        conspired – have*

(83) a. Helmut hat begriffen, **dass** er demnächst gehen muss.
        John – has – realised – that – he – soon – leave – must

     b. Helmut hat begriffen, **wer** demnächst gehen muss.
        John – has – realised – who – soon – leave – must

     c. *Helmut hat begriffen, **ob** er demnächst gehen muss.
        John – has – realised – if – he – soon – leave – must

Therefore, he rejects the formal equality of the two kinds of interrogatives (Fortmann 1994, 3):

Verbs subcategorising for a *[+wh]*-complement should be unspecified for its realisation and therefore allow generally both a *wh*-clause and a clause with the *[+wh]*-COMP (German **ob**).[29]

The same contextual distribution can be found in English:

(84) a. John is amazed **who** has been conspiring against him.

     b. John is amazed **that** his neighbours have been conspiring against him.

     c. *John is amazed **if** his neighbours have been conspiring against him.

(85) a. John has realised **that** he must leave soon.

     b. John has realised **who** must leave soon.

     c. *John has realised **if** he must leave soon.

It seems evident that *wh* is not a feature characteristic for interrogatives. An interrogative is a clause with the modal feature *Q* in C – independently of the absence or presence of the feature *wh*. The following assumptions are crucial for our analysis of *wh*-clauses:

–   The presence of *Q* is not dependent on *wh*-operators.
–   *Wh*-clauses selected by predicates not selecting *Q* do not contain *Q*.

How do *wh*-clauses embedded by interrogative verbs differ from those in the other contexts? Why can they be embedded by non-interrogative verbs at all?

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[29]   Translated from German, P.Ö.: Verben, die für einen *[+w]*-Komplementsatz subkategorisiert sind, sollten gleichgültig gegen dessen spezifische Realisierung sein und daher generell sowohl einen Satz mit einleitender w-Phrase zulassen als auch einen mit dem *[+w]*-Komplementierer **ob**.

The answer is quite simple and intuitive. Note the obvious difference in the interpretation of the *wh*-clause in (86), and those above in (83):

(86) a. Hugo fragt, **ob** sich wer gegen ihn verschworen hat.
     H. – asks – if – self – someone – against – him – conspired – has

b. Hugo fragt, **wer** sich gegen ihn verschworen hat.
     H. – asks – who – self – against – him – conspired – has

Indeed, both of the embedded clauses in (86) refer to *interrogatives*. *Wh*-focus adds further markedness to the CP. This property constitutes the logical difference between *wh*-interrogatives and **if**-clauses, where (under unmarked order and stress) the whole proposition is focused. The argument under the *wh*-operator in (86b) is not only a variable, but also the focus of the question. What the two clauses have in common is that the truth value of the embedded proposition is open.

This is not true for the other *wh*-clauses above. *Staunen/be amazed* in (82) is a *factive emotive* verb. *Begreifen/realise* in (83) is a *factive epistemic* verb. Both verbs embed a proposition presupposed as true, but not an interrogative. The *wh*-clauses embedded by these verbs are [+Tr] clauses with a *wh*-indefinite in focused position. They are propositions with a truth value, just like the parallel **dass**/**that**-clauses – even though they contain a focused variable. Compare the following sentences:

(87) a. John realised who should leave.

b. John asked if he should leave.

c. John asked who should leave.

In (87a), [*he* should leave] is true for all *worlds* where John should leave – an empty set obviously not excluded. In (87b), [*he/she* should leave] is true for all *individuals* that should leave – an empty set obviously excluded. In (87c), [*he/she* should leave] is also true for all *individuals* that should leave. An empty set is not excluded. Furthermore, [*he/she* should leave] is also true for all *worlds* where *any individual* should leave, but an empty set is not excluded in this case either.

Although *wh*-clauses like (87) carry 'openness' as a feature of a lexical constituent, openness is not a property of the whole proposition. It only applies to the individual bound by the *wh*-operator, i.e. the variable.

4.2   *wh*-Clauses [+Tr]

Factive epistemic predicates license *wh*-focus in embedded clauses independently of tense, mood and polarity of the main clause:

(88) a. She is in bad odour with me today. Now I **will** see **what an** agreeable character she has.

    b. She was in bad odour with me lately. Then I **saw what an** 'agreeable'[30] character she had.

In sentence (b), there is no nonveridical operator licensing a feature Q in the C-system of the embedded clause. The fronted *wh*-item stands for an 'open' argument that is focused, and the reading is non-interrogative in this case. It seems plausible that this class of predicates licenses Q in Foc° of the embedded clause. The *wh*-element expresses the focus of the predicate *see*. The licensing domain for *wh* must be defined by a focalising property of the main clause predicate. However, predicates allowing non-interrogative *wh*-complements do not allow embedded focus generally:

(89)   *I saw that an agreeable character he had.

(90) a. John realised whom he could not trust.

      b. *John realised that his friends he could not trust.

Interestingly, it is possible to have *only*-focus under factive epistemics, which indicates that these predicates in fact license nonveridical operators[31] in the FocP of their complements:

(91) a. They noticed that only to John had he told the truth.

      b. They noticed that only the truth had he not told to John.

      c. She realised that only for John would she put on her nicest dress.

      d. She realised that only her nicest dress would she put on for John.

In our terms, this means that factive epistemics can establish a WFD with Foc° by means of a specific feature. Other factive predicates license neither *wh*- nor *only-focus*:

(92) a. *John regretted whom he could not trust.

      b. *John regretted that only for Harold would Nancy put on her nicest dress.

As expected, these predicates do not license *wh*-focus in their complements in German either:

(93) *Er hat bedauert, **wer** da nicht zugehört hat.   (⇒ focus not licensed)
     he – has – regretted – who – there – not – listened – has

Note that a non-fronted *wh*-pronoun has an indefinite interpretation in German – it is an unfocused indefinite pronoun.

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    [30]   Note that, like in (45e) on page 15, the context forces us to interpret the attribute 'agreeable' as ironic if the embedded proposition is +Tr.

    [31]   That *only* is a nonveridical operator licensing NPIs is shown in (3b) on page 2.

(94) Er hat bedauert, daß da **wer** nicht zugehört hat. (⇒ embedded clause [+Tr],
no focus)
he – has – regretted – that – there – someone – not – listened – has

Again, it is obvious that *wh* is not the *relevant* feature for the interpretation of a clause as interrogative. In embedded clauses, there can be *Q* in Foc°, independent of clause mood, if they are selected by a V licensing this specific focus feature (say FOC^Q). As soon as *Q* is licensed by neither the matrix predicate nor a larger dependency, an embedded *wh*-clause does not have the logical potential of an interrogative:

(95) a. Er berichtete, **wer** das Radio repariert hat. (***Noone.**)   (+Tr)
he – reported – who – the – radio – repaired – has

b. Er berichtete, **dass** wer das Radio repariert hat.
he – reported – that – someone – the – radio – repaired – has

c. *Er berichtete, **ob** wer das Radio repariert hat.   (*Q* not licensed)
he – reported – if – someone – the – radio – repaired – has

(96) a. The BBC reported who won the election in New Zealand.   (+Tr)

b. The BBC reported that the Labour Party won the election in New Zealand.

c. *The BBC reported if the Labour Party won the election in New Zealand.   (*Q* not licensed)

4.3   *wh*-Interrogatives

Fortmann (1994, 9ff) suggests that the relevant difference between *Y/N*-interrogatives and *wh*-interrogatives is the scope of 'openness'. Firstly, the event instantiation can be open. This is the case when the truth value is undefined. Secondly, the Θ–reference can be open. This is the case when there is a variable focused by a *wh*-operator. What should be amended is that *wh*-**interrogatives** also denote an open event instantiation. This becomes evident through negative answers to *wh*-interrogatives:

(97) a. Who has conspired against Hugo? **No one.**

b. What did Hugo say? **Nothing.**

Of course, it is logically inadequate to assume an event of *conspiracy* where someone conspires against Hugo who is *no one*, or an event of *saying* where someone says *nothing*. If a *wh*-clause is an interrogative, both the event instantiation and the Θ-reference are open. Therefore, we amend the system proposed by Fortmann (1994, 11):

(98)

	Θ – reference	event instantiation
Y/N-interrogative, *if* – clause	+	–
wh-clause (interrogative)	–	–
wh-clause (non-interrogative)	–	+
'declarative', *that*-clause	+	+

Fronted *wh* is primarily a *focus operator* for open values/variables. It is not inherently correlated to the clause type *interrogative*. Therefore, *wh*-clauses not referring to questions can be embedded by non-interrogative verbs. *Wh*-items occur independently of *Q* in Mod°, provided that the matrix licenses *wh*-focus. In embedded *wh*-**interrogatives**, there is a *Q*-dependency licensing *Q* in Mod° of the embedded clause.

   This assumption is again supported by evidence from Persian. We assume that in languages like English and German, a fronted *wh*-element can parametrically lexicalise feature bundles like $[Q+FOC^Q]$, $[SUB+FOC^Q]$ or $[SUB+Q+FOC^Q]$. In Persian, the *Q*-particle *āyā* can be used both in *Y/N*-interrogatives and in *wh*-interrogatives (99a+b). In embedded clauses, *āyā* is optionally[32] preceded by the subordination marker *ke* (99c+d).[33] *Wh*-items can optionally be fronted to a position below *āyā* (99c). It is also possible to extract the *wh*-item from an *āyā*-clause (99d):

(99) a.   **āyā** Armin aks-e ye dinosaur-o be bābā-š dād?   (Lotfi 2003, 166)
           Q – *Armin – picture-of – one – dinosaur-ACC – to – father-his – gave*

         'Did Armin give his father a picture of a dinosaur?'

      b.   **āyā** Sohrab be pedar **če** goft?
           Q – *Sohrab – to – father – what – said*

         'What did Sohrab tell his father?'

      c.   man nemīdānam **ke āyā či-o**$_i$ ū t$_i$ mīxānad.   (Ahmad Lotfi, p.c.)
           I – NEG-know – SUB – Q – what-ACC – he/she – studies

         'I wonder what he/she studies.'

      d.   **či-o**$_i$ ān porsīd **ke āyā** to t$_i$ xāndi.
           what – DEM – asked – SUB – Q – you – studied

         '%What did he/she ask if you studied?'

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[32]   On the optionality of the subordination marker in extraposed clauses, cf. Öhl & Lotfi (2005).

[33]   Again, (99c+d) constitute direct evidence for a split CP consisting of more layers than proposed by Rizzi (1997). In our terms, the CP headed by *ke* dominates the ModP headed by *āyā*, which again dominates the FocP with the *wh*-pronoun in its specifier:

   (i)   man nemīdānam [$_{CP}$ **ke** [$_{ModP}$ **āyā** [$_{FocP}$ **chi-o**$_i$ [$_{IP}$ ū t$_i$ mīxānad]]]

It can be assumed that in all of these sentences **_āyā_** realises the same feature, i.e. *Q*.[34] Independently of the parametric realisation of features, interrogatives are characterised by the feature *Q*, the syntactic representation of the *nonveridical operator* in C. *Wh*-interrogatives are characterised through an additional feature [wh], or [FOC^Q] in our terms.

(100)a. He was asking [who] did not listen.   (focus on the variable)

   b. He was asking [if anybody did not listen] .   (maximal focus)

4.4   'Unselected embedded *wh*'

Lastly, we want to briefly consider *doxastic* verbs, which constitute a very specific class of epistemic predicates. They never select an **_if_**-clause, but they have the very special property of selecting *wh*-clauses only under a nonveridical operator:

(101)a. Sie glaubt nicht, **dass** ich Hugo vorhin getroffen habe.
      she – believes – not – that – I – H. – a-while-ago – met – have

   b. Sie glaubt *(**nicht**), **wen** ich vorhin getroffen habe.
      she – believes – not – who – I – a-while-ago – met – have

   c. *Sie glaubt nicht, **ob** ich Hugo vorhin getroffen habe.
      she – believes – not – if – I – H. – a-while-ago – met – have

(102)a. *Sie vermutet, **wen** ich gestern getroffen habe.
      she – presumes – who – I – yesterday – met – have

   b. Sie **wird** vermuten, **wen** ich gestern getroffen habe.
      she – will – presume – who – I – yesterday – met – have

   c. *Sie wird vermuten, **ob** ich dich gestern getroffen habe.
      she – will – presume – if – I – you – yesterday – met – have

(103)a. *She presumed **who** John would call.

   b. She did **not** presume **who** John would call.

   c. *She did not presume **if** John would call his brother.

The same is true for the complements of doxastic nouns:

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[34]   Our assumptions aboutwh-clauses [+Tr] above predict that **_āyā_** is not used in *wh*-clauses embedded by factive verbs. This is indeed confirmed by the Persian data.

  (i) man mīdānam ke (*āyā) čio$_i$ ū t_i mīxānad.   (Ahmad Lotfi, p.c.)
      I – know – SUB – what-ACC – he/she – studies
      'I know what he/she studies.'

(104)a. niemand wird die Annahme bestreiten, **wer** wen welche Steuern hinter-
ziehen lassen hat
*nobody – will – the – assumption – dispute – who – whom – which –
taxes – evade – let – has*

b. niemand wird die Annahme bestreiten, **dass** der intelligente Minister
seinen Gläubiger Steuern hinterziehen lassen hat

*nobody – will – the – assumption – dispute – that – the – intelligent –
minister – his – creditor – taxes – evade – let – has*

c. *niemand wird die Annahme bestreiten, **ob** der intelligente Minister
seinen Gläubiger Steuern hinterziehen lassen hat

*nobody – will – the – assumption – dispute – if – the – intelligent –
minister – his – creditor – taxes – evade – let – has* (Fortmann 1994, 6)

Thus, doxastic predicates are comparable with factive epistemic predicates by
the option of licensing Q in the C-Domain of the embedded clause if they are
co-member in a Q-dependency. However, they do not license the operator of
propositional disjunction but, rather, Q in Foc°. Interrogative verbs like ASK
license Q due to a lexical property. Factive epistemics can incorporate a polarity
sensitive head licensing Q in a *WFD* due to a lexical property. It can be con-
cluded that doxastic predicates can incorporate a more specific polar head
licensing FOC^Q in the FocP of the embedded clause; polarity sensitive heads,
however, are structurally licensed by *WFD*s with nonveridical operators.

5 Conclusion

The following assumptions have been argued for in this paper: what used to be
called *s-selection* is in fact subject to several factors, and what is defined by a
lexical entry is a semantic frame for its arguments, e.g. whether it will be a
proposition or a concrete referent. Furthermore, certain kinds of operators can
play a criterial role, which again depends greatly on the lexical properties of the
selecting predicate.

Factive epistemic predicates can be syntactically enriched by a polarity
sensitive head π, such that they select a Q-clause. π is licensed in the scope of
nonveridical operators. Thus, a nonveridical operator in the matrix clause
licenses Q in the embedded clause only indirectly. Q is a feature of propositional
disjunction, which is merged as a specific modal head in the C-system. This
head syntactically represents a nonveridical logical operator – a function operat-
ing on the truth value of propositions. Only a subgroup of the embedded ***if/ob***-
clauses refer to interrogatives. Q marks all clauses that share with questions the
property of being non-truth-evaluable due to propositional disjunction. Q is
generated in embedded clauses if the head carrying it is co-member in a well-
formed nonveridical dependency with the matrix verb. This dependency is

licensed if the matrix verb is interrogative, or if it is able to incorporate a polarity sensitive head that is either licensed by a nonveridical operator or itself represents a nonveridical operator. It has been argued that factive epistemic verbs have this property.

It has also been shown that *Q* and *wh* are two distinct features. Indeed, a subgroup of the embedded *wh*-clauses also carries the feature *Q* of propositional disjunction, and only these *wh*-clauses may refer to questions. *Wh* is a specific focus feature in the C-Domain that can also be licensed by a specific *WFD* with the matrix predicate. Factive epistemic verbs license *wh* even if they do not license *Q*. Doxastic verbs, however, license *wh* only under a nonveridical operator.

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